UMM AL-QURA UNIVERSITY FACULTY OF APPLIED SCIENCE PHYSICS DEPARTMENT GENERAL PHYSICS 1	جامعة أم القرى UMM AL-QURA UNIVERSITY	Name : Group : ID : Dec. 2022

Exercises - Chapter1

True or False questions

1. The SI system has only three base units. ✗
2. The definition of the standard for length is based on the speed of light in vacuum. ✓
3. The new definition of the second is based on the period of the Earth's rotation. ✗

MCQ Questions:

4. Which one among the following physics quantities is a derived quantity:
   - a- The mass of the proton
   - b- The radius of the Earth
   - c- The speed of sound
   - d- The period of oscillation of a simple pendulum

5. Given that the force can be written as $F = ma$, where m is the mass and a is the acceleration, the SI unit for the force is:
   - a- $kg\ m\ s$
   - b- $kg\ m/s$
   - c- $kg\ m/s^2$
   - d- $kg\ m\ s^2$

$$F = ma = m\frac{\Delta v}{T} = kg\ \frac{\frac{m}{s}}{s} = kg\frac{m}{s^2} = \frac{kgm/s^2}{N}$$

6. A small mass of $0.0000000256\ kg$ is written in scientific notation as:
   - a- $0.256 \times 10^{-7} kg$
   - b- $0.256 \times 10^{7} kg$
   - c- $2.56 \times 10^{-8} kg$
   - d- $25.6 \times 10^{-6} kg$

2.56×10^{-8}

Essay questions

7. The distance between two cities is d=525 km. Given that 1mile=1.609 km, convert this distance into miles.
8. Calculate the area of a piece of land $22m \times 30m$ in foot square ft^2. Given $1ft = 30.48\ cm$
9. Convert the acceleration due to gravity ($g = 9.80\ m/s^2$) into ft/s^2
10. A plant can grow 2.5 inches in 5 days, what is its growth rate in millimetres per hour. (1 in=2.54 cm)

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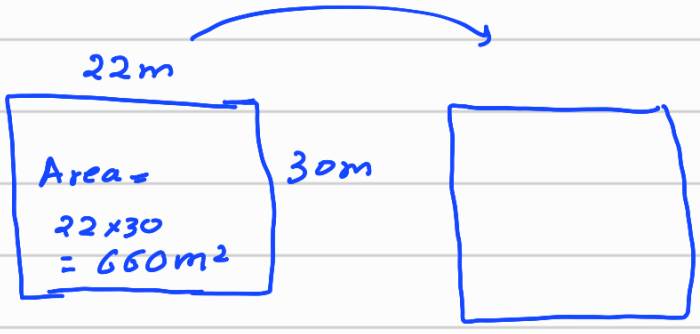
7) km → mile $\Rightarrow \frac{525}{1.609} = 326.22$

8)



1ft = 30.48cm

convert the lengths to cm by multiplying by 100

$22 \times 100 = 2200$ cm

$30 \times 100 = 3000$ cm

convert the length from cm to ft by dividing by 30.48

$2200\ cm = \frac{2200}{30.4}\ ft = 72.2\ ft$

$3000\ cm = \frac{3000}{30.4}\ ft = 98.4\ ft$

$Area = 72.2 \times 98.4 = 7104\ ft^2$

9) $9.8\ m/s^2 \Rightarrow$ ____ ft/s^2

$\frac{9.8\ m}{s^2} = \frac{9.8 \times 100\ cm}{s^2} = \frac{\frac{980}{30.48}\ ft}{s^2}$

$= 32.15\ ft/s^2$

10)

$$\text{growth rate} = \frac{2.5 \text{ inch}}{5 \text{ days}} = \_\_\_\_\_ \frac{\text{mm}}{\text{hr}}$$

$$\frac{2.5 \text{ inch}}{5 \text{ days}} = \frac{2.5 \times 2.54 \times 10}{5 \times 24} \frac{\text{mm}}{\text{hr}}$$

$$= 0.529 \text{ mm/hr}$$